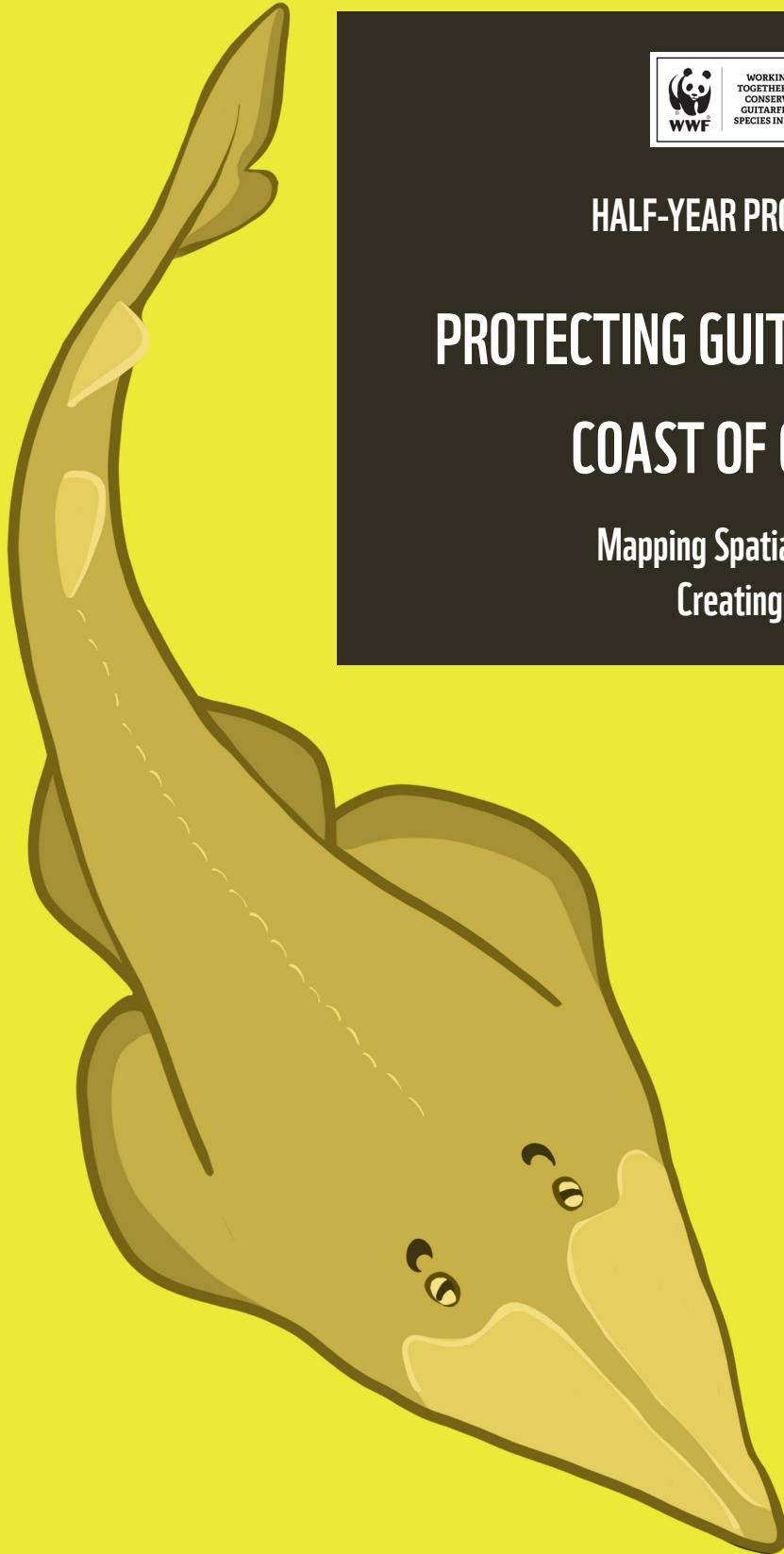




HALF-YEAR PROGRESS REPORT-II

# PROTECTING GUITARFISH ALONG THE COAST OF GOA IN INDIA

Mapping Spatial Distribution and  
Creating Awareness



<b>Project / Programme Name:</b>	Protecting Guitarfish Along The Coast Of Goa In India Mapping Spatial Distribution And Creating Awareness
<b>Project/Programme Number(s):</b>	
<b>Web Link(s) to project/programme strategic plan or other useful documents:</b>	
<b>Reporting Period:</b>	October 2021 – March 2022
<b>Project/Programme Start Date (FY):</b>	April 2021
<b>Project/Programme End Date (FY):</b>	
<b>Report Completed by:</b>	Aditya Kakodkar & Gaurav Patil
<b>Date Report Completed (MM/YR):</b>	5th May 2022

## Executive Summary

Guitarfish are closely related to sharks and rays. Their bodies are almost intermediate between the two. Due to the lack of economic value to the fishers, guitarfish are often neglected, even though they are an important predator in the intertidal food chain. They are also a good source of nutrition to coastal communities and bigger predators in the marine ecosystems.

In this project we attempt to collect baseline data about this fish through fisher interviews and by-catch analysis of in shore seines. The collated information will be used to plan outreach activities to improve knowledge about the guitarfish. It will also help in raising conservation awareness among the coastal communities.

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## About the project

The primary goal of this project is to conserve Guitarfish species along Goa's coastline. This project aims to collect local knowledge and map the distribution of the guitarfish in the coastal water. The project has been graciously supported by Sony India Pvt. Ltd.

Guitarfish is a very little understood fish as most of the data about its habitat and occurrence along Goa's coast is still unknown. Most of the guitarfish species are not well described and some prominent ones, such as the Whitespotted guitarfish (*Rhinobatus djiddensis*) are protected under India's Wildlife (Protection) Act, 1972. They are placed under the schedule – I (part II(A)). Other important species occurring in our waters including the Bowmouth guitarfish (*Rhina ancylostoma*) are listed as critical species in the IUCN red list. These fish are large in size are mostly encountered in deeper water, and are common bycatch in the trawl industry.

There are other smaller species found in the coastal waters and the Sharpnose (*Glaucostegus granulatus*) and Widenose guitarfish (*Glaucostegus obtusus*) are amongst the most common ones found in the inter-tidal regions. They interact mostly with shore seines and gill nets operated by smaller artisanal fishers.

Due to dearth of information about the species, we decided to collect the baseline data from the fishers by interviewing them. WWF India also decided to collect the actual occurrence data using the bycatch analysis in the shore seines. This activity would provide a complete picture of the past and present status of the guitarfish.

We interviewed the fishers with the help of a questionnaire to collect baseline information. The



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*Image-1: Early morning net operation is followed by separating main catch from bycatch*

questions were designed to obtain information about the habitat, distribution and present conservation status of the guitarfish. Presently, bycatch analysis of shore seine catch is being carried out. The study concentrates purely on the interaction of the guitarfish with the fishing gear. Our field teams are collecting the data on various parameters to understand the complete picture of the guitarfish's population dynamics and life cycle in the study area.

WWF India intends to work closely with the local fishing community to accomplish its objectives. It should be noted that no meaningful conservation can occur without the support and involvement of the local communities.

## Project Progress

### Project timeline

The project has three major objectives as represented in the Gantt chart below. These are:

1. Map the habitat and distribution of guitarfish along the coast of Goa
2. Raise awareness on the status and threats faced by guitarfish
3. Reduction of threats due to fisheries

All the sub-objectives, i.e., the collection and analysis of the baseline data collected from fishers, first phase of the guitarfish bycatch analysis and mapping of the distribution of the guitarfish along Goa's coastline were completed.

The first sub-objective of objective 2, i.e. objective number 2.1 was also completed. A Guitarfish ID guide was designed and produced to provide information about guitarfish to the fishers. In the

Timeline for the "Conserving Goa's Guitarfish Species through Baseline Data Mapping and Awareness Efforts"											
TIMELINE											
Sr. No.	Objectives/Month	Apr 21 - Jun, 21	Jul 21 - Sep 21	Oct 21 - Dec 21	Jan 22- Mar 22						
<b>1</b>	<b>Map Guitarfish habitat</b>										
1.1	Baseline DataCollection										
1.2	Bycatch data collection										
1.3	Mapping Distribution										
<b>2</b>	<b>Awareness on Guitarfish</b>										
2.1	Guitarfish ID Guide										
2.2	Fisher awareness										
	Report writing										
2.3	Communication material										
<b>3</b>	<b>Reduction of Fisheries Threat</b>	Starting in FY2 & FY3 (Phase 2 & 3)									
3.1	Workshop with local communities										
3.2	Engage with Govt./Stakeholders										

Fig-1: Timeline of the first year of the project

designing phase, the fishers were also conducted and their opinion was sought regarding the length and design of the guitarfish guide.

All the objective, intended to be completed in the first year are complete except, objective no. 2.2. The main reason for the delay in conducting awareness sessions for the fishers was the local gov-

ernment-imposed restrictions on indoor meetings during the third wave of the COVID19 pandemic. Due to the risk of COVID-19, fisher associations were not very keen on holding awareness sessions for their members and have urged us to try to get back to them during monsoon season when they do not practice fishing due to weather conditions and are hence free to attend sessions.

## Objective-wise progress

In the following sections we present the objective-wise progress of the project. The objectives are further divided into activities and each activity is marked with the status tag to indicate its present situation.

### Objective 1: Map the habitat and distribution of Guitarfish along the coast of Goa

#### ACTIVITY-1.1: Collect baseline data through social surveys

**STATUS: COMPLETE**

In the last report, the work related to the collection of the actual baseline data was described. A total of 112 individuals were interviewed, and their responses were collected for further analysis.

This analysis was conducted during the second half of the year the results of which are as follows:

The interviewed fishers were mostly artisanal fishers who use gill nets (including trammel nets) and shore seines. A small number of fishers using trawl nets and purse seines were also interviewed to gather information regarding guitarfish species presence in mechanized fisheries. Most of the interviewed fishers were between the age of 40 – 60 years, and most of them had a fishing experience of 30 – 40 years.

### Interaction of Guitarfish with Different Gear Types

There were interesting statistics regarding guitarfish’s interaction with the different types of fishing gears. It was observed that most of the individual fishers using gill nets reported that they encountered guitarfish regularly in their fishing gear, but the highest percentage of incidence was observed amongst the shore seiners. Similarly, larger mechanised fleet using purse seine reported more guitarfish interaction as compared to mini purse seine operators (Fig -2).

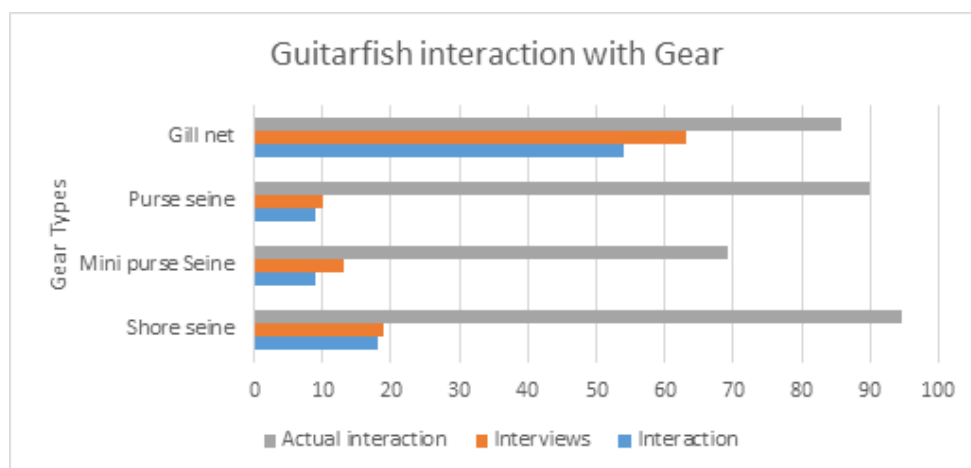


Fig-2: Interaction of Guitarfish with different gear types

## Regional Uses of Guitarfish

Different communities use guitarfish in Goa in various ways. We tried to collect data on how they use the guitarfish. There is an observed difference in the uses on guitarfish in North and South Goa. It was observed that the number of fishers selling and eating the guitarfish in the south was more than the fishers in the north (Fig -3). The percentage of discard of guitarfish is quite large at 34% in the north as compared to 11% in the south.

There could be various reasons such as cultural, traditional practices or religious background of the people which could explain this. Combining this data with local demographic or population survey data could help explain more.

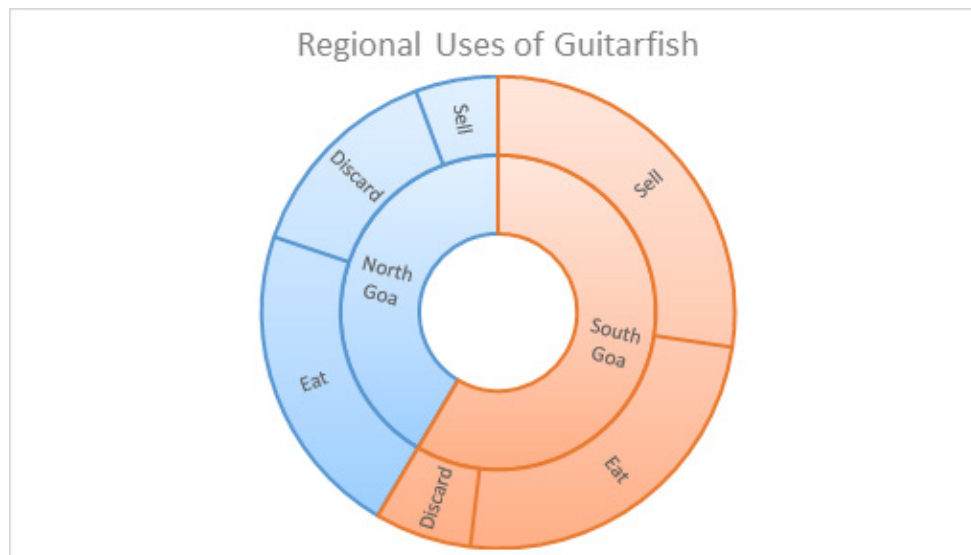


Fig-3: Uses of Guitarfish by region.

## Regional Distribution of Species

A wide range of opinions was obtained from the fisherman regarding the distribution of the guitarfish. As there was not much information regarding the distribution of guitarfish on Goa's coastline, obtaining proper identification of the species proved difficult. To aid in easy identification of the species by the fisherman, we created a guitarfish identification chart which contained seven species. This chart was used by the fishers to identify various guitarfish species.

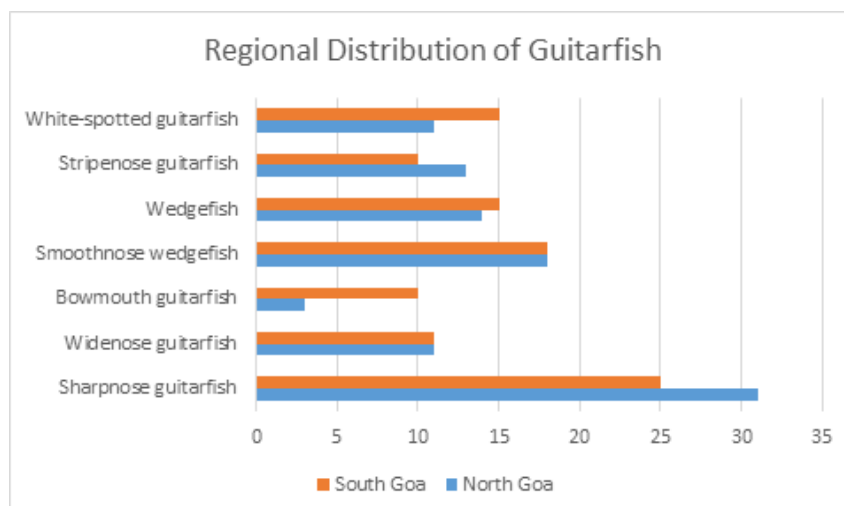


Fig-4: Regional distribution of Guitarfish

Information obtained from the fishers indicated that the Sharpnose guitarfish (*Glaucostegus granulatus*) was the most widely distributed species. Followed by the Smoothnose guitarfish (*Rhynchobatus laevis*) and Wedgefish (*Rhinobatus annandalei*). There were some species such as White Spotted guitarfish (*Rhinochobatus djiddensis*), Wedgefish (*Rhinobatus annandalei*) and Bowmouth guitarfish (*Rhina ancylostoma*), where the population was more in the South as compared to the north. This fluctuation cannot be confirmed without a proper bycatch analysis study in South Goa.

It should also be noted that only a few fishermen were accurately able to identify species of guitarfish. Further, Guitarfish species occurrence information obtained from the fishers cannot be used without on-ground surveys. The result of these surveys is mapped using GIS methodologies to create a guitarfish habitat map.



## Traditional uses of Guitarfish

There was some information regarding traditional use of the guitarfish was obtained. One of the most popular reason for the guitarfish consumption was that it was one of the traditional remedy for diseases linked to weakening of joints. People ate the fish to recover from dislocation injuries and gain strength.

Large guitarfish such as the White Spotted guitarfish (*Rhinochobatus djiddensis*) were also dried and made into a traditional South Goan pickle called 'Parro'. This pickle was carried on the ships for consumption or was consumed during the monsoons when fishing was not possible due to bad weather. It was also reported that this art has disappeared mainly as the people having knowledge of the recipes have long gone.



## ACTIVITY-1.2: Collect data on Guitarfish bycatch

### STATUS: IN PROGRESS

We conducted guitarfish bycatch survey from August 2021 to February 2022. During which a monthly trend was observed in guitarfish bycatch and fishing activity. The findings from the bycatch data shows that the guitarfish bycatch varied greatly in the monsoon and post-monsoon season.

In the month of August, a greater number of guitarfish bycatch was observed. It mainly composed of both juvenile and adult individuals. It was followed by a sudden drop in guitarfish numbers in September and again a sudden rise in the October where only juveniles were observed with no records of adult guitarfish individuals.



Post October, a moderate trend of Guitarfish bycatch was observed which composed of only juvenile individuals in bycatch. During this survey, it was observed that guitarfish juveniles die by the time shore seine net is dragged back to the shore. But the bigger individuals (30 cm and above) stay alive for some time even out of water when discarded on the shore from the net.



Image-2: Guitarfish bycatch sampling

During this survey at Caranzalem beach (Panaji, Goa), only one species of guitarfish i.e. wide-nosed Guitarfish (*Glaucostagus obtuses*) was observed. Through the fisher interviews, it was known that the sandy beach of Caranzalem, having a shallow continental shelf habitat, provides guitarfish with an ideal ground to feed and breed.

The findings of this initial bycatch survey from August 2021 to February 2022 provide supporting data on guitarfish in the offshore shallow waters of the Caranzalem as potential feeding grounds due to positive predator-prey occurrence. Due to the increase in bycatch of juvenile guitarfish in the post-monsoon season, there is a possibility that Caranzalem could be a nursery ground to these animals.

Through the fisher interviews, the presence of sharp-nosed Guitarfish (*Glaucostagus granulatus*) was confirmed from the same habitat. But during the survey, sharp-nosed guitarfish was never encountered.

Thus, more data on the guitarfish bycatch needs to be gathered to come up with more conclusive results on the diversity, breeding patterns and distribution of the guitarfish.

## ACTIVITY-1.3: Map Distribution of Guitarfish along the coast

### STATUS: COMPLETE

The shared images show the map representing Goa's coastline with red dots representing the fishermen's interview survey locations and green dots representing the guitarfish habitats identified by field visits and fisher knowledge.

The baseline data collected through 112 fishermen interviews is plotted on a 'Geographical information system' (GIS) map. The data is primarily segregated and plotted on the basis of interview location and the gear type used by the fishers. It is followed by the guitarfish species they have encountered and the depth at which they have seen it. The data makes this map a valuable resource for further studies by other researchers.

The map also shows the locations identified by WWF India's team as guitarfish habitats along the southern coast of Goa. These on field observations are made directly or indirectly with the help of fisher's traditional knowledge and observations by lifeguards who are present on the shore. The species mentioned in the 'Guitarfish habitat' attribute are identified using photographs clicked by enthusiasts, lifeguards and fishers from the same locations.

Along with maps, the QGIS file of the project will be shared further with other upcoming elasmobranch researchers.

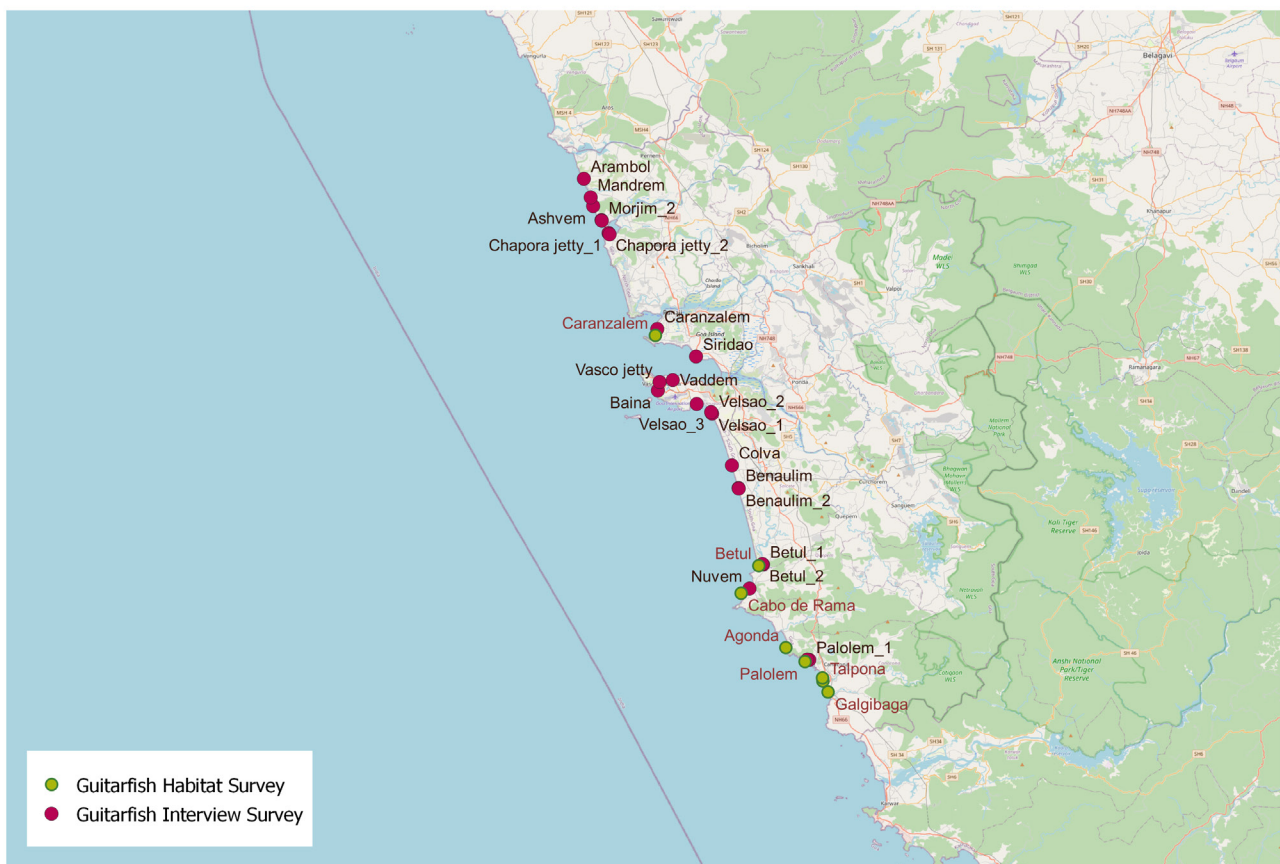


Fig-5: GIS map showing guitarfish interview survey and guitarfish habitat locations

## Objective 2: Raise awareness on the status and threats faced by Guitarfish

### ACTIVITY-2.1: Develop a local Guitarfish species identification guide

#### STATUS: COMPLETE

A 16-page booklet has been developed to help fishers identify and know more about the guitarfish. It will aid the awareness initiative, a major part of this project. The booklet also provides information on essential information and biogeography of the guitarfish.

The booklet includes information on what exactly is a guitarfish and how it is different from sharks and rays. A section on basic morphology of the guitarfish is also available for readers' reference. Full page information of seven species of guitarfish is presented with labelled identification features for each one of them. In-depth information regarding ranges, life stage and IUCN conservation status has also been listed.

The booklet is written in two languages i.e., English and Marathi. It presents information on guitarfish to local people who might not be familiar with English thus helping spread the information amongst all sections of the fisher community.

### ACTIVITY-2.1: Conduct awareness sessions for fishers along Goa's coastline

#### STATUS: IN PROGRESS

Two workshops were planned, one each in North and South Goa. Unfortunately, due to the increasing number of COVID-19 cases in January 2022, the fisher associations were not keen on holding awareness sessions. The state administrations also imposed local restrictions on holding indoor meetings, which further led to the loss of time, and the sessions could not be held.

We are in constant touch of the fisher associations and would like to approach them during the off-season i.e., from June 2022 onwards as this is the time when there is a fishing ban in Goa and the fishers have more time to attend awareness activities.



# Challenges

- The third wave of COVID-19 approached just as the government was easing the restrictions on public gatherings
- This brought in new restriction for indoor events and the fisher awareness sessions could not be planned.
- The fisher associations have not held their meetings regularly due to COVID-19 related restrictions. Fishing associations have been reluctant in providing permissions for the awareness sessions even after the local government lifted restrictions on public events. The shore seine operations are now conducted late at night to avoid daytime heat and tourists on the beach. Hence, it isn't easy to collect data regarding bycatch.

# Way forward

- We intend to conduct fisher awareness sessions during the monsoons. This is primarily because the fishing operations are halted due to extreme weather and the fishers will be free to attend the meetings.
- The second phase of the bycatch analysis will be conducted post-monsoon to collect more targeted data from the Caranzalem, Panjim shore seine operation.
- Efforts to popularise guitarfish conservation amongst general public will be done using awareness sessions similar to the ones being conducted for fishers.

